

REMARKS

Claims 1, 7-10, 13, 14 and 18 are pending in the present application. Claims 1, 9 and 10 have been amended. Claims 2, 3, 5, 6, 15, 19 and 20 have been canceled herein. Support for the present claim amendments may be found in the specification, at least, at page 20, line 23, page 41, lines 25-27, Table 1 on page 39, Table 2 on page 40. No new matter has been added by way of the above amendments.

Issues under 35 USC § 102 and 35 USC § 103

Claims 1-3, 5-8, 10, 13, 14 and 18 stand rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over USP 6,753,377 to Niinikoski et al. (hereinafter “Niinikoski”) as evidenced by Carraher, Jr. “Polymer Chemistry” (hereinafter “Carraher”).

Claims 9, 15, 19 and 20 stand rejected under 35 U.S.C. §103(a) over Niinikoski in view of USP 4,908,240 to Auhorn et al. (hereinafter “Auhorn”).

Legal Standard for Determining Anticipation

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.” *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) “The identical invention must be shown in as complete detail as is contained in the ...

claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Legal Standard for Determining Prima Facie Obviousness

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Supreme Court of the United States has recently held that the teaching, suggestion, motivation test is a valid test for obviousness, but one which cannot be too rigidly applied. See *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007).

The Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007) reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are:

- (a) determining the scope and contents of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

The Court in *KSR Int'l Co. v. Teleflex, Inc.*, *supra.*, did not totally reject the use of "teaching, suggestion, or motivation" as a factor in the obviousness analysis. Rather, the Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. § 103(a).

Even so, the Court in *KSR Int'l Co. v. Teleflex, Inc.*, *ibid.*, rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

Advantages of the Present Invention

The present invention provides a method of improving the paper qualities of a pulp sheet, which comprises adding the paper quality improver for internal addition to pulp slurry at the time of papermaking. The paper quality improver for internal addition according to the present invention exhibits a significant effect on improvement of stiffness, and is thus preferably used for the purpose of improving stiffness.

Discussion of Cited Prior Art

The outstanding rejection is based primarily on Niinikoski. However, the present claims have been amended in a manner sufficient to distinguish from the primary reference.

Niinikoski discloses vinyl acetate as an example of a monomer. Niinikoski discloses a polymer containing styrene in specified amounts (i.e., a polymer of 40 to 70% of an acrylic ester and 30 to 60% of styrene or a polymer of 0 to 19% of acrylonitrile, 10 to 60% of an acrylic ester and 10 to 60% of styrene). See Niinikoski at col. 3, lines 57-61.

However, Niinikoski fails to teach or suggest any polymer comprising at least vinyl monomer-derived structural units comprising 94.66 wt. % to 100 wt. % of vinyl acetate units. Furthermore, the present claims have been amended to recite that the glass transition temperature of polymer particles (B) is 32°C to 59°C. The glass transition temperature of the polymer disclosed in Niinikoski is outside of the presently claimed range. To facilitate the Examiner's understanding of the inapplicability of Niinikoski, Applicants offer the following explanation.

It is known to a person skilled in the art to calculate Tg of a copolymer by the following formula:

$$1/T_g = W_1/T_{g1} + W_2/T_{g2} + W_3/T_{g3} \dots$$

wherein Tg = Tg of a copolymer; Tg1, Tg2, Tg3 = Tg of homopolymers, respectively; W₁, W₂, W₃ = weight ratios of monomers, respectively.¹

¹ See **Rikigakuteki Seisitsu of Polymer**, published by Kagaku Doujin on May 1, 1969, submitted herewith, together with a partial translation thereof.

If the above formula is applied to Niinikoski Examples 1 and 3, you obtain the following:²

38.1 parts of acrylonitrile (0.19), 100.3 parts of butyl acrylate (0.5) and 62.2 parts of styrene (0.31).

Tg of polyacrylonitrile : 378°K; Tg of butyl polyacrylate : 219°C; and Tg of polystyrene: 373°K.

$$\text{Calculated Tg} = 1/(0.19/378 + 0.5/219 + 0.31/373) = 276.5\text{K} = \underline{3.3^{\circ}\text{C}}$$

Also, Example 2 of Niinikoski yields the following:²

115.3 parts of 2-ethylhexyl acrylate (0.5) and 115.3 parts of styrene (0.5)

Tg of 2-ethylhexyl acrylate : 223°C; and Tg of polystyrene : 373°C

$$\text{Calculated Tg} = 1/(0.5/223 + 0.5/373) = 279.1\text{K} = \underline{6.0^{\circ}\text{C}}$$

It is noted from the above that the Tg of the polymers in Examples 1 – 3 of Niinikoski is low and the polymers are very soft. When such soft polymers are used, the improvements of the claimed invention (i.e. superior strength) cannot be obtained.

The deficiencies of Niinikoski cannot be cured with Auhorn. Auhorn demonstrates a coating on paper. However, the combination of Niinikoski and Auhorn does not result in

² Tg's of polyacrylonitrile and polystyrene are referred to in Carraher, cited by the Examiner. Tg's of butyl polyacrylate and 2-ethylhexyl polyacrylate are referred to in **Polymer Handbook**, 3rd edition, submitted herewith.

increased bulk of paper as in the present invention. Accordingly, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections.

CONCLUSION

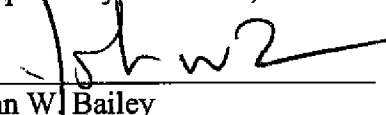
In view of the foregoing, Applicants believe the pending application is in condition for allowance. A Notice of Allowance is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Monique T. Cole, Reg. No. 60,154 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

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Attachments: Rikigakuteki Seisitsu of Polymer (1969), pages 26-27 (with partial translation); and

Polymer Handbook, 3rd Edition (1989), pages 216-217.